CHAPTER 7 WATER QUALITY PROGRAMS

"The objective of the Federal Water Pollution Control Act, commonly referred to as the Clean Water Act (CWA), is to restore and maintain the chemical, physical, and biological integrity of the nation's waters by preventing point and nonpoint pollution sources, providing assistance to publicly owned treatment works for the improvement of wastewater treatment, and maintaining the integrity of wetlands."–US EPA

This chapter provides an overview of DEQ's on-going commitment to the protection of water quality.

CHAPTER 7.1 WATER POLLUTION CONTROL

Virginia Pollutant Discharge Elimination System (VPDES)

The Commonwealth of Virginia has operated a successful state discharge permit program since 1946. The Federal Water Pollution Control Act (the Clean Water Act) was amended in 1972 to require a uniform permit program nationwide, allowing all states to uniformly control industrial and municipal wastewater discharges. Some states elected to have the federal government manage their permit program. Virginia requested delegation of authority from EPA to administer its own permit program in conformance with NPDES regulations. In April 1975, Virginia received the authority to administer the NPDES program as the VPDES permit program. The VPDES Permit Regulation, 9 VAC 25-31, establishes the procedures and requirements for this Program.

The 2004 General Assembly adopted legislation that transferred the VPDES construction activity and municipal separate storm sewer system (MS4) storm water permitting responsibilities from DEQ to the Department of Conservation and Recreation (DCR). EPA approved DCR's program at the end of December 2004 and the programs were transferred to DCR on January 29, 2005.

VPDES permits establish limits on the quantity and/or concentration of pollutants allowed in the discharge. The VPDES permits implement the applicable requirements of federal effluent guidelines, as well as the Virginia Water Quality Standards. Effluent limits are written to ensure that the most appropriate of these regulations is applied to the discharge. The permittee must monitor the quality of the effluent and report the results to DEQ. The permit also requires the facility to be properly operated and maintained.

Permits may also contain additional requirements detailed as "Special Conditions" in the permit. Examples of these special conditions are:

1. Pretreatment programs for publicly owned treatment works (POTW's) – requirements for the POTW to have the ability to control the discharges from contributing industries.

2. Storm water pollution prevention plans.

3. Toxics Management Program – this program requires the permittee to perform aquatic toxicity testing on the discharged effluent to determine reasonable potential for toxicity.

4. Land Application of Sewage Sludge.

DEQ is also utilizing the concept of general permits to streamline the permitting process and conserve resources of both the permittee and DEQ.

Individual Permits

- *Municipal Facilities*

There are approximately 620 Municipal discharges currently permitted in Virginia. The term municipal generally refers to facilities that treat predominantly domestic sewage and such facilities may be either publicly or privately owned. There are approximately 520 "minor" municipal dischargers ranging in size from > 1,000 gallons per day and < 1 million gallons per day and there are approximately 100 "major" municipal discharges, discharging at least one million gallons per day (mgd). Major facilities range in size from one to 75 mgd and treat about 95 percent of all the sewage in Virginia.

- *Industrial Facilities*

There are approximately 400 Industrial discharges currently permitted in Virginia. The industrial category of discharge generally refers to the discharge of wastewaters generated by industrial activities such as factories, power plants, and other industrial activities. Of these, about 42 are major facilities. Industrial facilities are assigned major and minor status through an agreement between EPA and the DEQ.

General Permits

General permits are written for a general class of discharge with similar effluent characteristics. Virginia was granted general permit authority from EPA in May 1991. General permits have streamlined the VPDES permit process, and reduced the paperwork, time and expense of obtaining a permit and allow staff resources to be concentrated on individual permits. General permits are promulgated as regulations and usually require application for coverage through the submittal of a Registration Statement. The following DEQ-administered VPDES general permits are available in Virginia: Petroleum Contaminated Sites, Groundwater Remediation, and Hydrostatic Tests; Storm Water Discharges Associated With Industrial Activity; Non-Metallic Mineral Mining; Domestic Sewage Discharges <= 1,000 GPD; Noncontact Cooling Water Discharges; Seafood Processing Facilities; Vehicle Wash Facilities; Concrete Product Facilities; Watershed Permit for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake bay Watershed; Coin Operated Laundries; Pesticide Discharges; and Potable Water Treatment Plants. The DEQ also administers Virginia Pollution Abatement (VPA) general permits for Concentrated Animal Feeding Operations and Poultry Waste Management.

There are more than 4400 dischargers in Virginia registered for coverage under the general permits mentioned above. Most of these are for coverage under either the Industrial Activity Storm Water General Permit, which regulates storm water run-off from selected industrial sites, or for the general permit for Domestic Sewage Discharges ≤ 1,000 GPD. Additionally, the Pesticide Discharges general permit does not require a discharger to register in order to be covered under the permit. Any operator that applies pesticides under one of the four pesticide use patterns (Mosquito and Other Flying Insect Control; Weed, Algae and Pathogen Control; Animal Pest Control; and Animal Pest Control) in, over or near surface waters in Virginia is automatically covered under the general permit.

DCR also administers two Virginia Stormwater Management Program (VSMP) general permits: one for storm water discharges from construction sites and the other for storm water discharges from small municipal separate storm sewer systems (MS4s). VSMP is DCR's version of VPDES permitting. DCR also issues individual VSMP storm water permits to the 11 large and medium MS4s in Virginia.

Fees for Permits and Certificates

The 1992 General Assembly enacted Section 62.1-44.15:6 of Article 2.1 of the Code of Virginia, which established a fee assessment and collection system for permits and certificates. In response to

this action, the SWCB adopted a water permit fee regulation, 9 VAC 25-20, which established fee schedules for permits and certificates. The assessment of fees allows DEQ to recover a portion of the cost of processing applications for permits or certificates which DEQ has the authority to issue. In 2002 the General Assembly amended and reenacted Section 62.1-44.15:6 of the Code of Virginia. These amendments increased the existing permit fees, and were intended to make the water permit program "self funding". The water permit fee regulation was modified to incorporate the amendments to the law, and the modification became effective on July 1, 2002. In 2004, the General Assembly again amended and reenacted Section 62.1-44.15:6 of the Code of Virginia, and made the increased fees permanent. The water permit fee regulation was modified again to incorporate the new amendments, and the changes became effective on July 1, 2004. The major change to the law and regulation was for VPDES and VPA individual permits. The reapplication fee was eliminated for these permits and replaced with an Annual Permit Maintenance Fee, which is to be paid by October 1st of each year. In 2010 the State Water Control Board adopted amendments to the Permit Maintenance Fees section of the Fee Regulation to address budget changes made by the 2010 General Assembly. The new permit maintenance fee schedule was effective August 18, 2010 and allows for an annual adjustment of the permit maintenance fees based on changes to the Consumer Price Index.

Fees have been established for VPDES, Virginia Pollution Abatement (VPA), Virginia Water Protection (VWP), Corrective Action Plan (CAP), Surface and Ground Water Withdrawals, and General Permits. Agricultural operations are exempt from payment of permit fees. Fees for VPDES permits range from $500 for a general permit to $24,000 for a VPDES “Industrial Major” permit. There are also fees for modifications and waivers.

Toxics Management Program

Requirements for toxics monitoring are written into VPDES permits as special conditions. These monitoring requirements are developed by the DEQ Toxics Management Program (TMP), which originated in the early 1980’s. The aim of the program is to involve all industrial and municipal VPDES permit holders that potentially discharge toxic pollutants into a systematic program of biological testing. This testing is designed to identify wastewater discharges that are toxic to aquatic life.

The need for a TMP is determined at the time of permit issuance, reissuance, or modification, using information provided by the permittee as part of the VPDES permit application, as well as additional data generated by the DEQ or other sources. Generally TMP special conditions include quarterly acute, or acute and chronic toxicity testing using vertebrate and invertebrate species. The duration of testing may be based on a time period with a regular frequency (e.g., quarterly testing for one year), an event prior to discharge, or until a certain number of tests have been performed. Once the TMP data have been generated for a particular outfall, they are evaluated for reasonable potential for toxicity. If the data do not show reasonable potential, the permittee may continue biological testing at a much-reduced frequency. However, if the data show reasonable potential, a Whole Effluent Toxicity (WET) limit is developed and put into the permit with a compliance schedule.

Pretreatment Program

Virginia’s Industrial Pretreatment Program controls industrial discharges to POTWs. These municipal sewage treatment plants are usually not designed to treat toxic industrial wastes. Such wastes may interfere with the plant’s biological treatment processes, pass through untreated into receiving waters or contaminate POTW sludge to the extent that lawful disposal is precluded. POTWs with industrial contributors should develop a Pretreatment Program and become the Control Authority. EPA delegated oversight and regulation of the POTW pretreatment programs to the DEQ on April 14, 1989.

Standards imposed on industrial users include general standards, prohibitive discharge standards, categorical standards, and local limits developed by POTWs. General standards are narrative prohibitions against pass-through and interference and are applicable to all industrial users. Prohibitive discharge standards are also applicable to all industrial users and include limitations on parameters such as pH and temperature, measured in industrial discharges. Categorical standards are federal technology-

based standards developed for certain categories of industries discharging to POTWs. In addition, POTWs are required to develop local limits for substances that have the potential to cause interference with treatment or pass through in toxic amounts to receiving waters.

Pretreatment facilities are controlled through municipal ordinances and are required to self-monitor and report biennially to the municipality which reports to DEQ.

The Virginia Compliance Auditing System

The DEQ monitors the performance of municipal and industrial dischargers through a computerized compliance auditing system. Under the VPDES permit program, major facilities are required to submit monthly plant performance reports based upon self-monitoring of the parameters listed in the discharge permit. Minor facilities report on an individually assigned frequency. These discharge-monitoring reports (DMRs) indicate the quality of plant effluent and whether any bypasses have occurred. Data from DMRs are entered by the regional offices into DEQ's Comprehensive Environmental Data System (CEDS), which compares all parameters to permit limits or other permit conditions, or other orders to detect any violations.

When a permit or other enforceable violation is observed through CEDS, the system assesses weighting points according to the severity and frequency of the violation(s). In addition to the automatic detection of effluent violations through CEDS, compliance schedules, as well as other required due dates both in permits and enforcement actions, are also tracked through CEDS. Weighting points are also assigned for single event violations reported to DEQ by permittees, the public or other sources. All weighting point values are assessed and tallied for the previous six reporting periods. When accumulated values exceed specified limits, or any time a violation is observed which is determined to cause environmental harm, enforcement action may be initiated. Additional enforcement activity may result from problems discovered during on-site inspections.

The accumulated records of weighting point values are used as a tool to aid objective focus when determining appropriate enforcement activity. The program also ensures that permittees are fully aware of problems as they develop and have an opportunity to improve treatment in order to maintain compliance.

Virginia Pollution Abatement Permits

A Virginia Pollution Abatement (VPA) Permit may be issued by the DEQ whenever an owner handles wastes or wastewater in a manner that does not involve discharging to a sewage treatment facility or to state waters pursuant to a valid VPDES permit. The Virginia Pollution Abatement Permit Regulation (9 VAC 25-32) was adopted in 1996. Pollution abatement facilities approved through the VPA permit program may include pits, ponds, and lagoons for waste storage, treatment, or recycling. Permits are also required for on-site facilities, such as land treatment systems. The basis for approval for such systems includes assurance that waste or wastewater will not discharge directly into state surface waters except under prescribed extreme rainfall conditions, and for protection of ground water quality.

To address and gauge compliance with the state's groundwater standards, whenever pits, ponds, lagoons, and/or land treatment is part of a proposed or VPA-permitted facility, a ground water monitoring program may be required as part of, or prior to, receiving approval for a VPA permit. Land application is a no-discharge alternative to conventional discharging systems. Land treatment is frequently a cost-effective alternative to direct discharge to surface waters, and can be a technically sound means of waste or wastewater utilization.

Concentrated Confined Animal Feeding Operations

Concentrated animal feeding operations (CAFOs) are currently regulated under Virginia State Law and constitute approximately 140 of the over 1100 AFOs currently permitted under the VPA program. CAFOs include dairy, beef, swine, and poultry operations in Virginia. In 2003, EPA published a

federal rule requiring CAFOs with over a specified number of animals to be permitted under the federal NPDES program. In 2004, Virginia amended the regulations and developed a new VPDES CAFO general permit to address the federal rule. The new general permit became effective on January 1, 2006. However, due to the ruling of the U.S. 2nd Circuit Court of Appeals in the case of Waterkeeper Alliance et al. vs. EPA, registration requirements for CAFOs will be delayed until the EPA completes amendments to the rule required by the 2nd Circuit decision. The VPDES program will then be amended to conform to the modified federal CAFO rule. In the interim, CAFOs will continue to be covered by individual or general VPA permits that require these facilities to maintain a "no-discharge" status, implement nutrient management plans, and conform with many of the same requirements as the VPDES permit. Those not affected by the federal rule but which are currently regulated under the VPA program will continue to be permitted by either individual VPA permits or covered by one of the existing VPA general permits for such facilities.

VPDES Compliance Inspection Program

The DEQ Virginia Pollutant Discharge Elimination System (VPDES) Permit program, the Pretreatment program, the Virginia Pollution Abatement (VPA) Permit program, and the VPDES and VPA general permit program rely primarily on the concept of permittee self-monitoring and reporting for compliance determinations. To insure proper operation and maintenance of facilities and confirm self-monitoring information is representative and accurate, the DEQ conducts facility inspections as the principal form of regulatory compliance surveillance. The DEQ utilizes a risk-based protocol to identify facilities needing increased or decreased inspection frequency and/or complexity while using staff resources most effectively to accomplish inspection goals.

Inspection Program Objectives

The objectives of the inspection program are:

- to assure that facilities are in compliance with statutes, regulations, and permit requirements, thereby protecting the quality of state waters
- to improve facility performance by providing advice and assistance,
- to support permit development,
- to maintain a regulatory presence,
- to support administrative, civil, and criminal enforcement actions,
- to support development and implementation of the pretreatment program.

Each inspection of a wastewater treatment facility will not accomplish every objective but most inspections are useful in accomplishing several of the above objectives. Therefore, inspection frequencies are scheduled to provide maximum coverage of facilities within available DEQ resources. See Table 7.1-1. Additionally, inspections can be a scheduled or unscheduled activity in response to public complaints or requests from outside DEQ.

Table 7.1-1 Inspection frequency by facility type

	INSPECTION FREQUENCY		
Inspection Type	**Annually**	**Biennially**	**5 Years**
VPDES Municipal Major (≥1.0 MGD)		**X**	
VPDES Municipal Minor (≥0.04 & ≤1.0 MGD)		**X**	
VPDES Municipal Small (≥0.001 & ≤0.04 MGD) [1]			**X**
VPDES Industrial Major (DEQ/EPA Majors list)		**X**	
VPDES Industrial Minor (not a Major or Small)		**X**	
VPDES Industrial Small [2]			**X**

1 Includes multiple home and non-residential domestic wastewater facilities covered by General Permit.

VPDES General			X
VPDES Sampling [3]			X
VPG (AFO)	X		
VPA (High Priority) [4]	X		
VPA (Low Priority) [5]			X
Commercial Laboratory (Major) [6]	X		
Commercial Laboratory (Minor) [7]		X	

4 High priority is assigned to facilities with high environmental impact potential or high public concern and includes animal feeding operations, wood preserving operations, sludge disposal activities, and other facilities so classified by the Regional Offices. An inspection of sludge disposal permitted facilities includes, as a minimum, an inspection of the storage facilities and at least one land application site per permitted facility per year.

5 Low Priority is a VPA facility with low environmental impact potential.

6 Major Commercial Laboratories are those who serve ten or more minor VPDES/VPA permittees and/or 1 major facility.

7 Minor Commercial Laboratory designation is assigned to all other facilities not considered as high priority.

Water Quality Planning and TMDLs

DEQ uses Water Quality Management Plans (WQMPs), required by section 303(e) of the Clean Water Act, as the link between the water quality assessment required for this report and water quality based controls. These plans recommend control measures for the water quality problems identified and characterized in the 305(b) report. Control measures recommended in the plans are implemented through the VPDES permit system for point sources and through the application of Best Management Practices (BMPs) for nonpoint sources. WQMPs establish the strategy for returning impaired waters to meet water quality standards and for preventing the degradation of high quality waters.

Waterbodies are classified as effluent limited (E.L.) where water is known to meet state water quality standards after the application of technology-based effluent limits or other required controls. Waterbodies not meeting existing water quality standards after the application of technology-based effluent limits or controls are classified as water quality limited (W.Q.L.).

DEQ uses the WQMPs to implement the Total Maximum Daily Load (TMDL) process required by Section 303(d) of the Clean Water Act. TMDLs are the allowable loadings or loading strategies for waterbodies classified as water quality limited. The TMDL process is a mechanism for integrating the point and nonpoint source loads contributing to the impairment of the waterbody. Only by controlling both sources of pollutants can water quality be restored to the affected waterbodies.

Watershed Programs (TMDLs) and Federal Grants Utilization

Statutory and Regulatory Framework: Section 303(d) of the 1972 Clean Water Act requires the states to identify waters not in compliance with water quality standards, establish priorities, develop a biennial list of the impaired waters, and develop Total Maximum Daily Loads (TMDLs) for the waters on the 303(d) list. In July 1992, EPA promulgated regulations, 40 CFR 130.7, for 303(d) of the CWA. TMDLs were to be implemented through existing pollution reduction regulations and voluntary strategies. In 1997, the Virginia General Assembly enacted the Water Quality Monitoring, Information, and Restoration Act, §62.1-44.19:4 through 19:8 of the Code of Virginia. This statute directs DEQ to develop a list of impaired waters and develop TMDLs for these waters. Also, the state statute directs DEQ to develop implementation plans for the TMDLs.

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2 Small is an industrial facility with low environmental impact potential such as discharges of non-contact cooling water, sand and gravel operations, car washes, etc.

3 Sampling inspections are conducted subject to the availability of effluent.

The State Water Control Law, Chapter 3.1, Article 1 of the Code of Virginia, authorizes the State Water Control Board to control and plan for the reduction of pollutants impacting the chemical and biological quality of the state's waters that result in the degradation of designated uses.

Beginning in 1998, Virginia and other States were required to prepare plans for restoring the quality of polluted waters on the 303(d) list of impaired waters. These restoration plans are called TMDLs. A TMDL Report is a special study to determine the amount of a pollutant that the impaired water can assimilate and still meet water quality standards. Additionally, the TMDL report will identify all sources of pollution contributing to the violation of water quality standards and calculate the pollutant amount entering the stream from each source and calculate reductions in pollutant loads needed for attainment of Water Quality Standards.

For many years, DEQ's pollution reduction efforts were focused on the treated effluent discharged into Virginia's waters via the VPDES permit process. The TMDL process has expanded the focus of DEQ's pollution reduction efforts from the effluent of wastewater treatment plants and other point sources to the other pollutant sources causing impairments of the streams, lakes, and estuaries. In TMDL Implementation Plans, the reduction tools are being expanded from the permit process to include a variety of voluntary non-point source strategies and BMPs to address load and wasteload reductions (point sources and non-point sources).

No Discharge Zones (NDZs) are one tool for remediating bacterial contamination, particularly in smaller, poorly-flushed tidal Chesapeake Bay tributaries. This remediation tool is recommended in all tidal TMDLs where shellfish are present. Under the Clean Water Act, discharge of untreated sewage is illegal; NDZs are federally designated areas where this prohibition is extended to discharge of any vessel sewage. States seeking this designation for a water body must demonstrate to EPA that 1) adequate local disposal alternatives (such as marina-based pump-outs) exist, and 2) the designation protects natural resources.

In Virginia, DEQ is the lead agency for preparing NDZ applications. Applications may be initiated, as a component of a TMDL implementation plan or by request from the public. With cooperation of its sister agencies, DEQ conducts analyses to estimate peak-season boat traffic for the area under evaluation, and assesses the existence and adequacy of all available disposal alternatives. DEQ also conducts intensive public outreach to solicit and strengthen local support to elevate boaters' awareness of the importance of controlling bacteria sources. Once established, the designation is indicated by prominent on-the-water signage.

There are currently three NDZs in Virginia: the Lynnhaven River near Virginia Beach, three tidal creeks in lower Middlesex County, and Smith Mountain Lake. The Lynnhaven River NDZ is regarded as a key element in that river's remarkable recovery from bacteria pollution, documented as a national "success story" by EPA (USEPA, 2009, *Section 319 Nonpoint Source Program Success Story - Virginia*). House Bill 1774, passed by Virginia legislature in February, 2009, resolved that all tidal Bay tributaries be designated NDZs, and directs DEQ to pursue such designation with EPA. The legislature further clarified, through approval of House Bill 1943 in 2011, that NDZs shall be premised on the improvement of impaired tidal creeks. DEQ responded to the 2009 legislative action with an initiative focusing on tidal creeks along Virginia's Northern Neck (the peninsula of land separating the tidal Potomac and Rappahannock Rivers). This area was selected primarily based on citizen, business, and local government support expressed at TMDL public meetings. In early 2012, DEQ intends to submit to EPA four NDZ applications covering approximately 40 impaired water bodies in the Northern Neck. The applications are the result of collaboration between DEQ and the Northern Neck Planning District Commission during this assessment period.

TMDL Schedule

In 1998, the American Canoe Association and the American Littoral Society filed a complaint against EPA for failure to comply with the provisions of §303(d) of the CWA in Virginia. In 1999, EPA signed a Consent Decree with the plaintiffs. The Consent Decree contained a TMDL development

schedule through year 2010. This schedule required a TMDL to be developed on the approximately 475 impaired waters and the approximately 225 condemned or restricted shellfish waters identified in Virginia's 1998 303(d) list. Many of these impaired waters were impaired by more than one pollutant.

Since fulfilling the requirements of the 1999 Consent Decree, Virginia has developed a TMDL Development pacing guideline of approximately 150 TMDLs per biennium. Virginia expects this pacing guideline will allow for TMDL development for currently listed waters by 2022.

Table 7.1-2 TMDL Consent Decree (CD) Segments[1]

Year	CD TMDLs	Shellfish TMDLs	**Total**
2000	13	0	**13**
2002	30	0	**30**
2004	86	0	**86**
2006	92	94	**186**
2008	87	62	**149**
2010	166	69	**235**
Totals	474	225	**699**

[1] Consent Decree segments may be impaired by more than one pollutant. This table includes CD segments that were delisted or reclassified as non-impaired through the Triennial Review process

Virginia TMDL Program links to EPA Goals and Objectives

General Outputs and Outcomes**:**

GOAL: Restore watersheds and their aquatic ecosystems to support economic and recreational activities, human health, and provide healthy habitats for fish, plants and wildlife.

OUTPUTS/OUTCOMES: Calculate reduction of nitrogen, phosphorus, sediment, bacteria, and toxics (where applicable) from point and nonpoint sources to improve water quality. Stimulate stakeholder behavioral changes towards water quality and environmental stewardship. Develop approvable TMDLs leading to Implementation Planning and implementation. The tables below reflect adjustment for segments de-listed.

Table 7.1-3 TMDLs Completed or Scheduled

Year	CD TMDLs	Shellfish TMDLs	Non-CD TMDLs	**Total**
2000	11	0	0	**11**
2002	24	0	0	**24**
2004	91	0	8	**99**
2006	76	94	36	**206**
2008	70	62	82	**214**
2010	89	69	77	**235**
2012			150	**150**
Totals	361	225	353	**939**

Segments covered in TMDL Implementation Plans

Completed 1999-2011	166
In progress	25

See the draft and final TMDL Reports and Implementation Plans at http://www.deq.virginia.gov/tmdl/.